

What is claimed is:

1. An ink jet recording medium comprising
an absorbent paper base sheet, and
a three-dimensional porous coating on said base sheet,
said coating comprising a reaction product of polyvinyl alcohol and boric acid wherein the molecule bonds are principally polyvinyl alcohol-boric acid-polyvinyl alcohol bonds,

said coating comprising a sieve or screen facilitating penetration of ink carrier vehicle to said base sheet while holding ink pigment or colorant out on the sieve or screen.
2. A recording medium as set forth in Claim 1 wherein said coating includes an immobilizer.
3. A recording medium as set forth in Claim 2 wherein said immobilizer is glyoxal, zirconium or epoxy based.
4. A recording medium as set forth in Claim 1 wherein said coating includes an ink setting agent.

5. A recording medium as set forth in Claim 4 wherein said ink setting agent comprises a cationic or conductive polymer.

6. A recording medium as set forth in Claim 1 wherein said coating includes a pigment.

7. A recording medium as set forth in Claim 1 wherein said coating is comprised of from about 75 to about 96 parts by weight polyvinyl alcohol and from about 1 to about 6 parts by weight boric acid.

8. A recording medium as set forth in Claim 7 wherein said coating includes from about 0.25 to about 4 parts by weight insolubilizer.

9. A recording medium as set forth in Claim 7 wherein said coating includes from about 0.5 to about 5 parts by weight ink setting agent.

10. A recording medium as set forth in Claim 7 wherein said coating includes from about 0.25 to about 4 parts by weight insolubilizer and from about 0.5 to about 5 parts by weight ink setting agent.

11. A recording medium as set forth in Claim 7 wherein said coating includes up to about 50 parts by weight pigment.

12. A recording medium as set forth in Claim 1 wherein said coating is comprised of from about 75 to about 96 parts by weight polyvinyl alcohol and from about 2 to about 4 parts by weight boric acid.

13. A recording medium as set forth in Claim 12 wherein said coating includes from about 0.5 to about 1 part by weight insolubilizer.

14. A recording medium as set forth in Claim 12 wherein said coating includes from about 1 to about 3 parts by weight ink setting agent.

15. A recording medium as set forth in Claim 12 wherein said coating includes from about 0.5 to about 1 part by weight insolubilizer and from about 1 to about 3 parts by weight ink setting agent.

16. A recording medium as set forth in Claim 12 wherein said coating includes up to about 10 parts by weight pigment.

17. A recording medium as set forth in Claim 1 wherein said base sheet has a basis weight as low as 28 pounds per 3,000 square feet.

18. A recording medium as set forth in Claim 1 wherein said base sheet has a basis weight of from about 28 pounds to about 270 pounds per 3,000 square feet.

19. A recording medium as set forth in Claim 1 wherein said base sheet is a high gloss supercalendered paper having a basis weight in the order of about 80 to 270 pounds per 3,000 square feet.

20. A recording medium as set forth in Claim 1 wherein said base sheet is comprised of one or more of chemical, chemi-mechanical and mechanical pulps, size and one or more wet strength additives.

21. A recording medium as set forth in Claim 20 wherein said base sheet is manufactured from a furnish comprised by weight of about 50 parts hardwood chemical pulp, about 50 parts softwood chemical pulp, about 25 parts paper machine broke, from about 0.25 to about 2 percent rosin size and from about 0.25 to about 1.5% of one or more wet strength additives.

22. A recording medium as set forth in Claim 21 wherein the furnish includes in the order of about 0.25 percent by weight cationic agent.

23. A recording medium as set forth in claim 21 wherein said base sheet has a basis weight of from about 28 to about 270 pounds per 3,000 square feet.

24. A recording medium as set forth in Claim 21 wherein said base sheet is sized with rosin or alkyl ketene dimer and a wet-strength additive and is dimensionally stable.

25. A recording medium as set forth in Claim 21 wherein said base sheet has a basis weight as low as 28 pounds per 3,000 square feet.

26. A recording medium as set forth in Claim 1 wherein said coating has a coat weight of from about 1.3 to about 2.7 pounds per 3, 000 square feet.

27. A recording medium as set forth in Claim 1 wherein said base sheet has a basis weight as low as 28 pounds per 3,000 square feet, and said coating has a coat weight of from about 1.3 to about 2.7 pounds per 3,000 square feet.

28. A coating composition for use in the manufacture of ink jet recording media comprising, in aqueous solution,

a reaction product of polyvinyl alcohol and boric acid wherein the molecule bonds are principally polyvinyl alcohol-boric acid-polyvinyl alcohol bonds,

said coating composition, when applied to an absorbent substrate, forming a three-dimensional, porous screen or sieve facilitating penetration therethrough to the absorbent substrate of ink carrier vehicle and hold-out on the screen or sieve of ink pigment or colorant.

29. A coating composition as set forth in Claim 28 comprised of from about 75 to about 96 parts by weight polyvinyl alcohol and from about 1 to about 6 parts by weight boric acid.

30. A coating composition as set forth in Claim 29 including from about 0.25 to about 4 parts by weight immobilizer.

31. A coating composition as set forth in Claim 29 including from about 0.5 to about 5 parts by weight ink setting agent.

32. A coating composition as set forth in Claim 28 comprised of from about 75 to about 96 parts by weight polyvinyl alcohol and from about 2 to about 4 parts by weight boric acid, from about 0.5 to about 1 part by weight immobilizer, and from about 1 to about 3 parts by weight ink setting agent.

33. A method of making a coating composition for use in the manufacture of ink jet recording media comprising the steps of
providing coating composition makedown water,
heating the water,
adding boric acid to the heated water with mixing until the boric acid is substantially completely dissolved in the water,
adding polyvinyl alcohol to the boric acid containing heated water and continuing to heat the water until the polyvinyl alcohol is substantially completely dissolved in the water,
cooking the polyvinyl alcohol and boric acid together until a reaction has taken place between the polyvinyl alcohol and the boric acid such that the molecule bonds in the reaction product are principally polyvinyl alcohol-boric acid-polyvinyl alcohol bonds.

34. A method as set forth in Claim 33 including the step of adding an immobilizer to the composition.

35. A method as set forth in Claim 33 including the step of adding an ink setting agent to the composition.

36. A method as set forth in Claim 34 wherein the immobilizer is glyoxal, zirconium or epoxy-based.

37. A method as set forth in Claim 35 wherein the ink setting agent is a cationic or conductive polymer.

38. A method as set forth in Claim 33 wherein the makedown water comprises from about 75 to about 85 percent by weight of the composition, the boric acid comprises from about 0.5 to about 1.0 percent by weight of the composition, and the polyvinyl alcohol comprises from about 15 to about 24 percent by weight of the composition.

39. A method as set forth in Claim 33 wherein the makedown water is heated to a temperature of from about 160°F to about 200°F for boric acid addition and dissolution and is heated to a temperature of from about 200°F to about 210°F for polyvinyl alcohol addition and for cooking the polyvinyl alcohol and boric acid mixture.